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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/602,945	06/24/2003	John F. Grubb	RL-1627DIV	1816

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EXAMINER
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DOVE, TRACY MAE

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 02/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/602,945

Applicant(s)

GRUBB, JOHN F.

Examiner

Tracy Dove

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 November 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 23-40 and 42-54 is/are pending in the application.
- 4a) Of the above claim(s) 23-35 and 44-54 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 36-40, 42 and 43 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

This Office Action is in response to the communication filed on 11/16/05. Applicant's arguments have been considered, but are not persuasive. Claims 23-40 and 42-54 are pending with claims 23-35 and 44-54 being withdrawn from consideration. This Action is FINAL.

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 36-40, 42 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Simpkins et al., US 6,613,468 in view of Taruya et al., JP 2000-294256.

Simpkins teaches a solid oxide fuel cell comprising an electrolyte 40 disposed between and in ionic communication with an anode 30 and a cathode 50 to form an electrochemical cell 10. The solid oxide fuel cell further includes an interconnect 24 (Figure 1; 2:61-66). The solid electrolyte may comprise zirconium oxide (zirconia) (3:20-42). The interconnect is electrically conductive and may comprise a ferritic stainless steel material (6:46-67).

Simpkins does not explicitly teach the ferritic stainless steel of the claimed invention.

However, Taruya teaches a fuel cell comprising a separator (interconnect) having a specific ferrite stainless steel composition. Respective component elements of the ferrite stainless steel composition are 10.5-35 wt% of chromium, 0-6 wt% of molybdenum, not more than 0.018 wt% of carbon, not more than 0.2 wt% of titanium and not more than 0.3 wt% of niobium (abstract). The ferrite stainless steel separator may be contained in a fuel cell (0020).

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Taruya teaches the molybdenum range is preferably 0.5-5 wt% of the ferrite stainless steel composition (0041). Taruya is silent regarding the claimed properties of the ferrite stainless steel. However, since the compositional limitations are disclosed in Taruya, then the recited properties would have been inherent in the teachings of Taruya absent any proof to the contrary.

Therefore, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because one of skill would have been motivated to use the ferrite stainless steel composition of Taruya for the interconnect of Simpkins in view of the teaching by Simpkins that a ferritic stainless steel material may be used for the interconnect. Furthermore, the courts have ruled a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985) (Claims to titanium (Ti) alloy with 0.8% nickel (Ni) and 0.3% molybdenum (Mo) were not anticipated by, although they were held obvious over, a graph in a Russian article on Ti-Mo-Ni alloys in which the graph contained an actual data point corresponding to a Ti alloy containing 0.25% Mo and 0.75% Ni.).

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Claims 36-40, 42 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kearl, US 6,828,055 in view of Internet printouts for Haynes 556™ Alloy ("556") and/or Haynes 263™ Alloy ("263") and/or Haynes HR-120™ Alloy ("120").

Kearl teaches a bipolar plate for a fuel cell stack. The fuel cell may be a proton exchange membrane fuel cell or a solid oxide fuel cell (9:7-20). The bipolar plate may be a heat and/or corrosion resistant metal such as stainless steel, nickel, iron, chromium, tungsten, carbon, cobalt,

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titanium and alloys thereof. The alloys may be members of the INCONEL™ family or members of the HAYNES™ or HASTELLOYS™ families of alloys. A solid oxide fuel cell comprises an anode, a cathode and a stabilized zirconia electrolyte between the anode and the cathode.

Kearl does not explicitly teach the ferritic stainless steel alloy of the claimed invention.

However, 556 teaches a stainless steel alloy comprising 22 wt% Cr, 3 wt % Mo, 0.1 wt% C and 0.6 wt% Ta. 263 teaches a stainless steel alloy comprising 20 wt% Cr, 6 wt% Mo, 0.06 wt% C and up to 2.4 wt% Ti. 120 teaches a stainless steel alloy comprising 25 wt% Cr, up to 2.5 wt% Mo and 0.05 wt% C.

Therefore, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because one of skill would have been motivated to use 556, 263 and/or 120 for the bipolar plate of the solid oxide fuel cell of Kearl in view of the teaching by Kearl that a HAYNES™ family alloy may be used. The courts have ruled a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985) (Claims to titanium (Ti) alloy with 0.8% nickel (Ni) and 0.3% molybdenum (Mo) were not anticipated by, although they were held obvious over, a graph in a Russian article on Ti-Mo-Ni alloys in which the graph contained an actual data point corresponding to a Ti alloy containing 0.25% Mo and 0.75% Ni.).

Kearl is silent regarding the claimed properties of the stainless steel. However, since similar compositional limitations are disclosed in the cited references and the claimed invention,

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then one of skill would have reasonably expected the properties of the claimed stainless steel to be similar to the stainless steel of the prior art, absent any proof to the contrary.

***Response to Arguments***

Applicant's arguments filed 11/16/05 have been fully considered but they are not persuasive.

Note Applicant has not presented any arguments regarding the 35 U.S.C. 103(a) rejection of claims 36-40, 42 and 43 over Kearn, US 6,828,055 in view of Internet printouts for Haynes 556™ Alloy ("556") and/or Haynes 263™ Alloy ("263") and/or Haynes HR-120™ Alloy ("120"). Thus, there is nothing for the Examiner to rebut.

Regarding the 103(a) rejection of claims 36-40, 42 and 43 over Simpkins et al., US 6,613,468 in view of Taruya et al., JP 2000-294256, Applicant argues Simpkins teaches "a ferritic stainless steel that is coated with exotic material may be used as an interconnect in solid oxide fuel cells". Applicant asserts this teaching actually teaches away from the "simple steel" with the claimed composition. However, the claims recite an interconnect "comprising" a ferritic stainless steel, which does not exclude a coating. Thus, it is unclear how Applicant reaches the conclusion that Simpkins teaches away from the "simple steel" of the claimed invention.

Applicant argues Simpkins and Taruya are not properly combined because Simpkins teaches a solid oxide fuel cell and Taruya teaches a solid polymer electrolyte fuel cell. However, it is known in the art the interconnect materials of one type of fuel cell, in addition to other materials such as manifold and housing materials, may be substituted for interconnect materials of another type of fuel cell. Both Simpkins and Taruya teaches ferritic stainless steel

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interconnect materials for fuel cells. *Applicant has not provided any persuasive argument why the interconnect materials of a polymer electrolyte fuel cell is not applicable as an interconnect material of a solid oxide fuel cell.* Applicant points out that some material of a solid oxide fuel cell may not be used for a polymer electrolyte fuel cell. Examiner agrees. However, Examiner is not relying upon using the electrolyte or electrode materials of the polymer electrolyte fuel cell of Taruya for the solid oxide fuel cell of Simpkins. Such arguments are not applicable to the rejections of record.

Examiner requests Applicant reference the specific section of Taruya that teaches “Taruya teaches that there would be no reasonable expectation of success in using components designed for use in one type of fuel cell in other types of fuel cells”, as asserted by Applicant. Applicant argument that a ferritic stainless steel interconnect was “designed for use” in a polymer electrolyte fuel cell is not supported. The prior art clearly teaches ferritic stainless steel interconnects are used (“designed for use”) in solid oxide fuel cells (Simpkins) and in polymer electrolyte fuel cells (Taruya).

Applicant further states Taruya does not teach the claimed ferritic stainless steel alloy because the alloy of Taruya does not include the addition of tantalum. This argument is not commensurate in scope with the claimed invention. See at least claim 36 “at least one of niobium, titanium OR tantalum”. Applicant argues “not of the alloys of Table 1, or otherwise disclosed in Taruya or Simpkins have the claimed composition”. It is unclear what Applicant is intending to argue. Only one alloy present in the prior art is necessary to anticipate or render obvious the claimed composition. Taruya does not teach away from the claimed invention, as asserted by Applicant.

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tracy Dove whose telephone number is 571-272-1285. The examiner can normally be reached on Monday-Thursday (9:00-7:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



**TRACY DOVE**  
**PRIMARY EXAMINER**

January 27, 2006